



2008-2012

# CANCER IN MONTANA

FEATURING COLORECTAL CANCER TRENDS AND PREVENTION MEASURES TO REDUCE FUTURE CASES



MONTANA CENTRAL TUMOR REGISTRY ANNUAL REPORT

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Quick Stats for All Cancer

**5,540**  
**MONTANANS**

DIAGNOSED WITH CANCER EACH YEAR BETWEEN 2008-2012

**NUMBER**  
**ONE**

CAUSE OF DEATH AMONG MONTANANS  
EACH YEAR

**ONE**  
**IN TWO**

MEN WILL BE DIAGNOSED WITH CANCER IN THEIR LIFETIME

**ONE**  
**IN THREE**

WOMEN WILL BE DIAGNOSED WITH CANCER IN THEIR LIFETIME

# Cancer in Montana, 2008-2012

**Cancer is a common disease; one in two men and one in three women will be diagnosed with cancer in their lifetime.<sup>1</sup> This report describes the burden of cancer among Montanans and includes a special feature on colorectal cancer trends and prevention measures.**

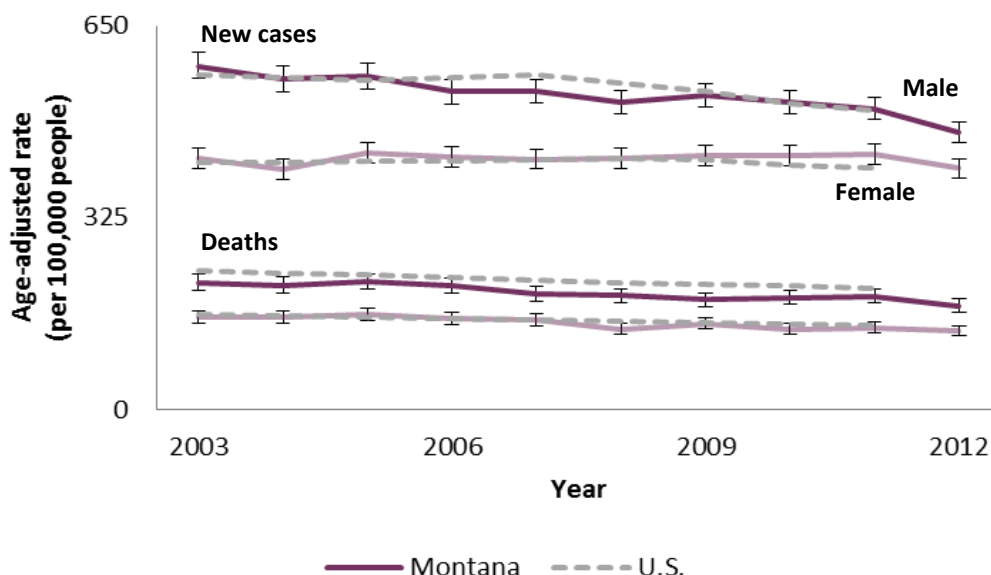
A total of 32,459 incident cancer cases were reported to the Montana Central Tumor Registry (MCTR) between 2008-2012, including invasive and in-situ cancers, benign tumors, and tumors of uncertain behavior. Invasive cancers accounted for 26,999 cases (83%); carcinoma in-situ accounted for 4,539 cases (14%). An average of 5,540 invasive cancers were

diagnosed each year among Montana residents between 2008 - 2012.

Over half (53%) of cancers diagnosed in Montana occurred among men. The cancer incidence rate was higher among males compared to females in Montana and the U.S. from 2003-2012 (Figure 1). Although the difference in the incidence rate between males and females has decreased over the past decade (2003-2012).

Cancer was the leading cause of death in Montana from 2008-2012, followed closely by heart disease. There were a total of 9,593 cancer deaths from 2008-2012 with an average of 1,920 cancer deaths each year over this time period. The cancer death (mortality) rate among Montana residents was the same as the U.S. (Figure 1).

**Figure 1. Trends in age-adjusted cancer incidence (new cases) and mortality (deaths) rates in Montana and the U.S., 2003-2012.**



Data Source: Montana Central Tumor Registry, 2003-2012; Montana Death Records, 2003-2012; [United States Cancer Statistics, 2003-2011](#)

<sup>1</sup> Howlader N, Noone AM, Krapcho M, Garshell J, Miller D, Altekruse SF, Kosary CL, Yu M, Ruhl J, Tatalovich Z, Mariotto A, Lewis DR, Chen HS, Feuer EJ, Cronin KA (eds). SEER Cancer Statistics Review, 1975-2011, National Cancer Institute. Bethesda, MD, [http://seer.cancer.gov/csr/1975\\_2011/](http://seer.cancer.gov/csr/1975_2011/), based on November 2013 SEER data submission, posted to the SEER web site, April 2014.

Four types of cancer accounted for 51% of all new cancers diagnosed in Montana from 2008-2012. These cancers were prostate (15%), breast (14%), lung (13%), and colorectal (9%).

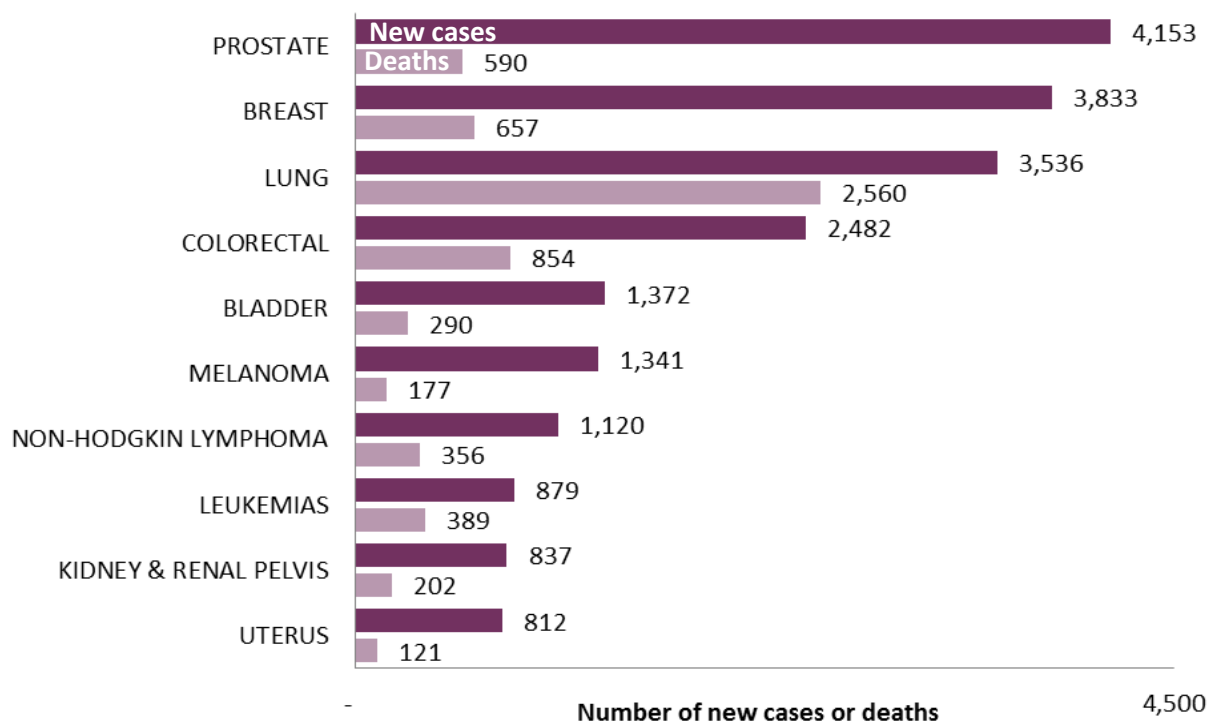
The most common cancer-related deaths in Montana were lung and bronchus (27%), colorectal (9%), breast (7%), and prostate (6%) (Figure 2). Similar to new cancer diagnoses, these four sites accounted for 49% of cancer deaths in Montanans.

The incidence rate for all cancers in Montana was estimated to be 1% below the U.S. incidence rate. This difference was not statistically different and, therefore, we can conclude that the overall cancer incidence rate in Montana was the same as the U.S. (Figure 3). The incidence rate of kidney, lung, prostate, and colorectal cancers were statistically significantly lower in Montana compared to the U.S. (Figure 3). In contrast,

the incidence rates of bladder, leukemia and melanoma cancers were statistically significantly higher than the U.S. rates (Figure 3).

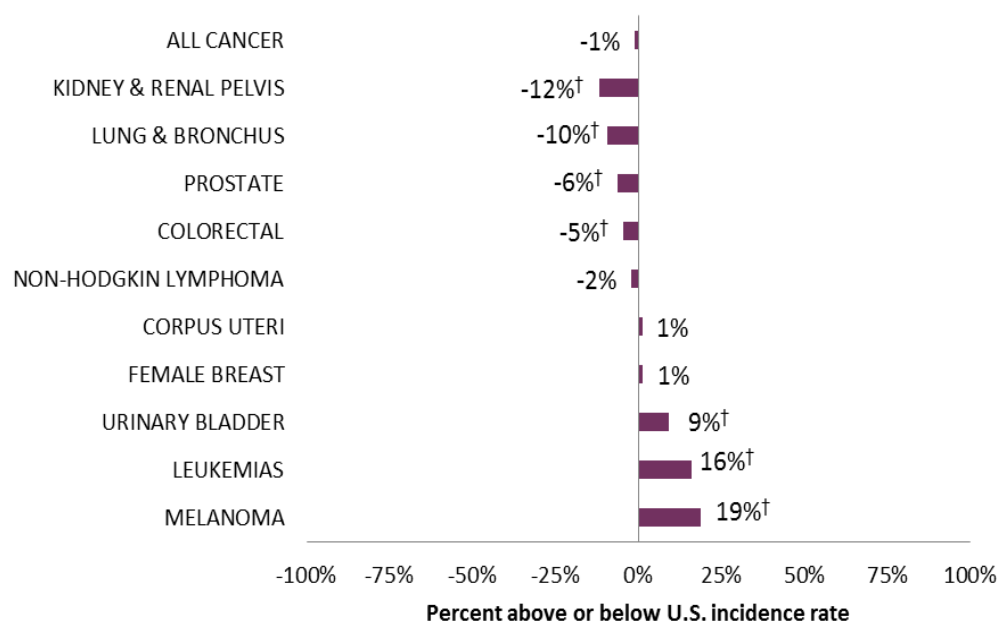
The cancer mortality rate for all cancers in Montana was significantly lower than the U.S (Figure 4). Two cancer sites, lung and colorectal, were significantly lower than the U.S. (Figure 4). The mortality rate for prostate cancer in Montana was statistically higher than the U.S. (Figure 4).

**Figure 2. Number of new cases (incidence) and deaths (mortality) of the 10 most common cancers in Montana over the 5-year period 2008 through 2012.**

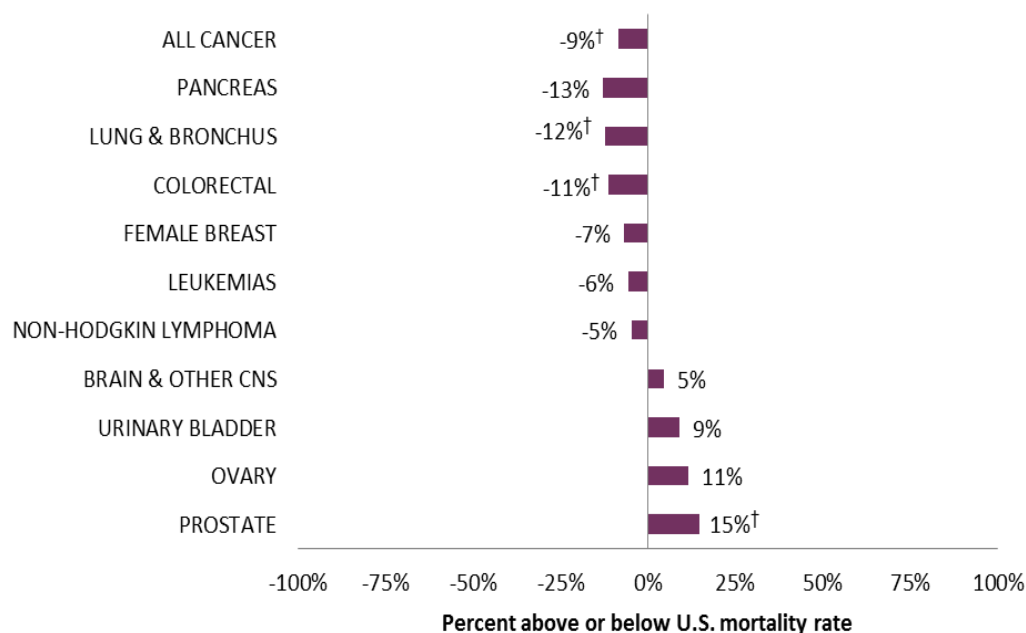


Data Source: Montana Central Tumor Registry, 2008-2012; Montana Death Records, 2008-2012

**Figure 3. Comparison of Montana and U.S. incidence rates for the select cancer sites, 2008-2012.**



**Figure 4. Comparison of Montana and U.S. mortality rates for the select cancer sites, 2008-2012.**



Figures 3 and 4 presents the Montana -U.S. Incidence Rate Ratio (IRR) and Mortality Rate Ratio (MRR). The IRR and MRR indicate which types of cancers among Montanans were above or below the U.S. age-adjusted incidence rate or mortality rate, respectively. This information is important in understanding the unique burden cancer presents to Montana.

† Statistically significantly different

Data Source: Montana Central Tumor Registry, 2008-2012; Montana Death Records, 2008-2012; [United States Cancer Statistics, 2007-2011](#)

Colorectal Cancer in Montana  
Quick Stats

**500  
NEW CASES**

OF COLORECTAL CANCER ARE DIAGNOSED EACH YEAR

**170  
DEATHS**

DUE TO COLORECTAL CANCER  
EACH YEAR

**THIRD  
LOWEST**

MT RANKING AMONG STATES FOR  
CRC SCREENING

**315,000  
ADULTS**

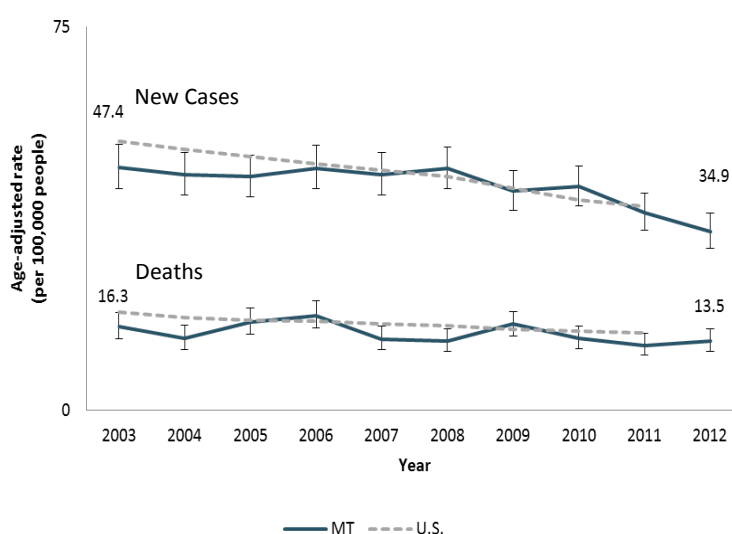
ARE OF SCREENING AGE (50-75 YEARS)

## Special Feature: Colorectal Cancer Trends and Prevention Measures to Reduce Future Cases

Colorectal cancer (CRC) is the third most common type of cancer diagnosed and the third most common cause of cancer-related death among men and women in Montana.

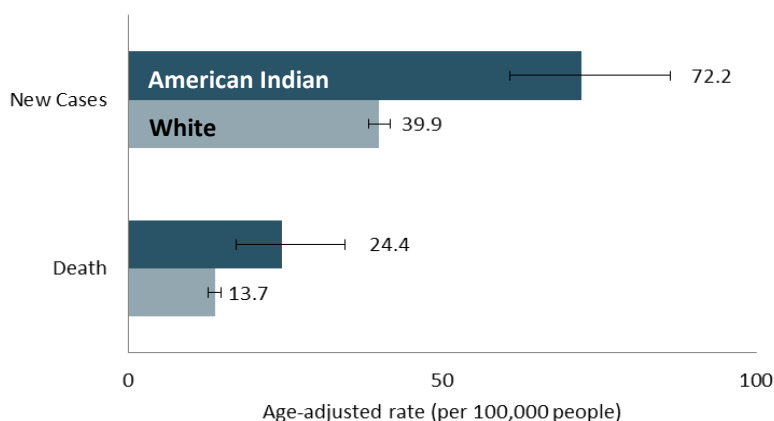
- 2,483 Montanans were diagnosed with CRC between 2008-2012 for an average of 500 cases each year.
- The incidence rate of CRC has statistically significantly decreased from 47.4 cases per 100,000 people in 2003 to 34.9 cases per 100,000 people in 2012 (Figure 5).
- 854 Montanans died of CRC between 2008-2012 for an average of 170 deaths each year.
- The CRC mortality rate has remained unchanged over the past decade (2003-2012).
- The incidence rate of CRC among MT American Indians (72.2 cases per 100,000 people [95% Confidence interval: 60.7-86.3]) was nearly two times greater compared to MT Whites (Figure 6).
- The CRC mortality rate among MT American Indians was also greater than MT Whites (Figure 6).

Figure 5. Trends in age-adjusted colorectal cancer incidence and mortality rates in Montana and the U.S., 2003-2012.



Data Source: Montana Central Tumor Registry, 2003-2012; Montana Death Records, 2003-2012; [United States Cancer Statistics, 2003-2011](#)

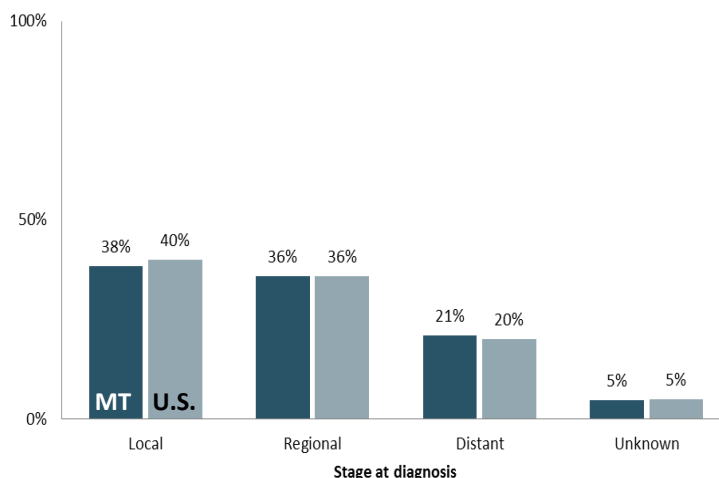
Figure 6. Colorectal cancer incidence and mortality rates by race in Montana, 2008-2012.



Data Source: Montana Central Tumor Registry, 2008-2012; Montana Death Records, 2008-2012

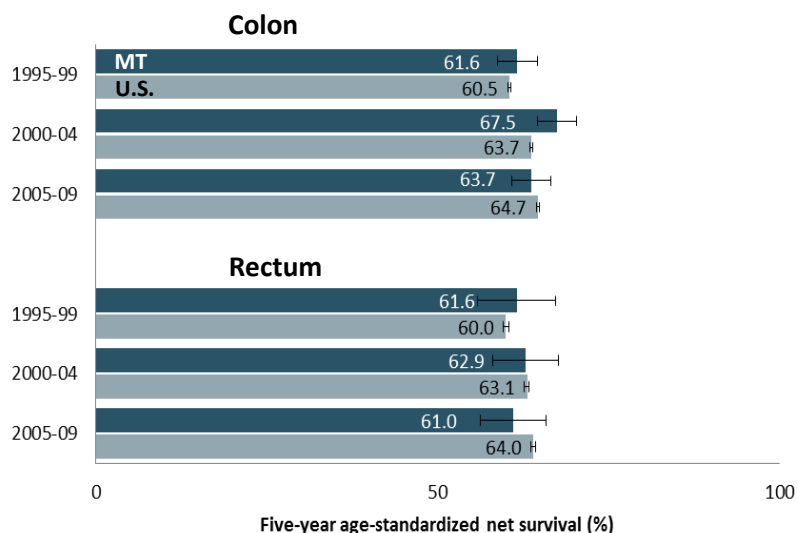
- 54% of CRC cases occurred among men and 46% among women.
- From 2008-2012, the average age at diagnosis was 68 years. The average age at diagnosis was 62 years among American Indian cases and 69 years among Whites.
- Nearly two in five CRC cases (38%) were diagnosed at the local stage (Figure 7). Survival greatly improves for patients diagnosed at an early stage.
- For cancers diagnosed between 2005-2009 (the most recent years analyzed), 63.7% of colon cancer patients and 61.0% of rectum cancer patients were alive 5-years after diagnosis (Figure 8).
- The percent of patients in Montana who were still alive 5-years after diagnosis with colon and rectum cancers was statistically the same as the U.S. (Figure 8).

**Figure 7. Stage at diagnosis for colorectal cancers, Montana and U.S., 2008-2012.**



Data Source: Montana Central Tumor Registry, 2008-2012; [SEER, 2004-2010](#)

**Figure 8. Five-year age-standardized net survival (percent) of adults (aged 15-99 years) with colon and rectum cancers by calendar period of diagnosis, Montana and U.S.**



Data Source: Allemani C, Weir HK, Carreira H, Harewood R, Spika D, Wang XS, et al. Global surveillance of cancer survival 1995-2009: analysis of individual data for 25,676,887 patients from 279 population-based registries in 67 countries (CONCORD-2). *Lancet*; 385 (9972): 977-1010.

## Prevention Measures

CRC screening can detect cancer or pre-cancerous polyps before symptoms are present. Because most CRC arises first as a polyp, colonoscopy and polyp removal can prevent the development of invasive cancer. Screening and early detection can reduce the mortality from CRC by as much as 60%.

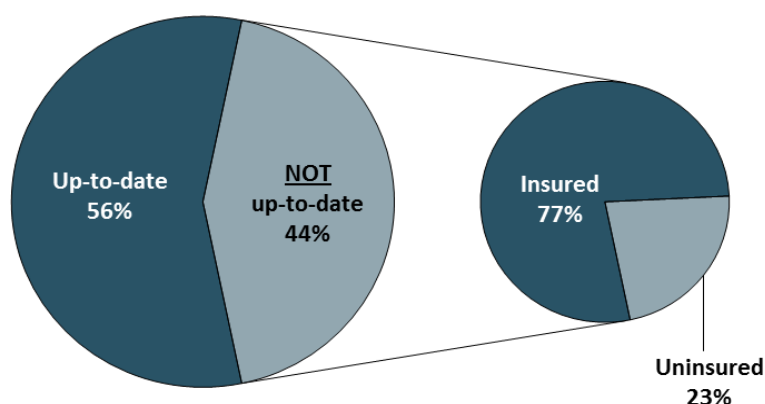
The National Colorectal Cancer Roundtable and the American Cancer Society set a goal of 80% CRC screening participation among U.S. adults by 2018. There are approximately 315,000 adults in Montana that are of screening age (50 to 75 years). In order for Montana to reach the 80% screening goal, approximately one-quarter million (250,000) adults need to be up-to-date with CRC screening in 2018.

- In 2012, Montana ranked third lowest among all U.S. states with regard to the percent of adults up-to-date with CRC screening with only 56% up-to-date (Figure 9).
- In 2012, 3 out of 4 adults (77%) who were not up-to-date with screening had health insurance (Figure 9).
- Screening participation was about equal between men and women (56% and 57%, respectively).
- 45% of American Indians aged 50 to 75 years were up-to-date with CRC screening in 2012.
- Among Montanans up-to-date with CRC screening, colonoscopy was the most commonly completed test (53%) followed by FOBT/FIT (7%).

**Table 1. The United States Preventive Services Task Force (USPSTF) CRC screening recommends for men and women aged 50 to 75 years of average CRC risk.**

Type of Test	How Often?
High sensitivity fecal occult blood test (FOBT) or fecal immunochemical tests (FIT)	Once a year
Flexible sigmoidoscopy	Every 5 years
<i>combined with</i> FOBT/FIT	Every 3 years
Colonoscopy	Every 10 years

**Figure 9. Percentage of Montana adults aged 50 to 75 years reported to be up-to-date with CRC screening by health insurance status, Montana Behavioral Risk Factor Surveillance System 2012.**



Data source: [Montana Behavioral Risk Factor Surveillance System 2012](#)

Cancer Among Montana American Indians  
Quick Facts

**260**  
**NEW CASES**  
OF CANCER DIAGNOSED EACH YEAR

**80**  
**DEATHS**  
DUE TO CANCER EACH YEAR AMONG  
MONTANA AMERICAN INDIANS

**28**  
**PERCENT**  
OF CANCER-RELATED DEATHS WERE DUE TO LUNG CANCER

## Cancer among American Indian residents of Montana, 2008-2012

**Cancer presents a significant burden to all American Indians throughout Montana.**

From 2008-2012, there were a total of 1,290 Montana American Indians (MT AI) diagnosed with cancer for an average of 260 new cases each year.

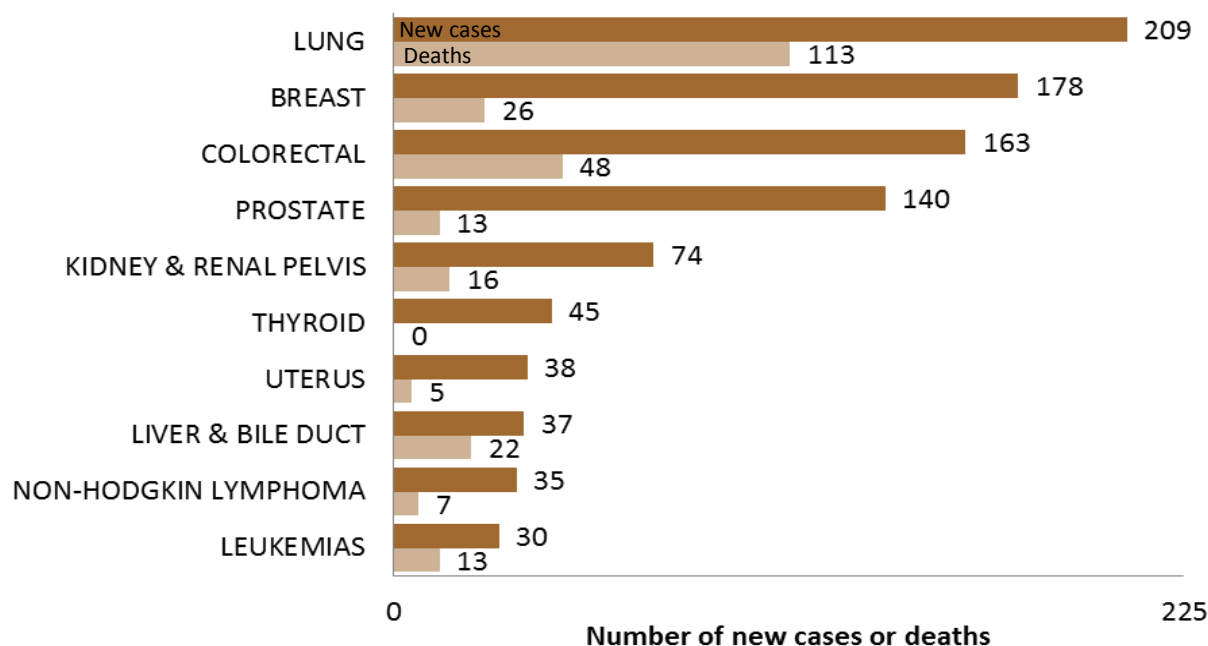
Lung cancer was the most commonly diagnosed cancer among AIs followed by female breast, colorectal and prostate cancers (Figure 10). These four types of cancer accounted for 53% of all cancers diagnosed among MT AI.

More women were diagnosed with cancer than men from 2008-2012 (53% compared

to 47%). The average age at diagnosis was 61 years old.

From 2008-2012, cancer was the second leading cause of death with 398 cancer related deaths among MT AI. On average, there were 80 cancer deaths each year. Lung cancer accounted for 28% of cancer related deaths among MT AI (Figure 10).

**Figure 10. Number of new cases and deaths for the 10 most common cancers among Montana American Indians over the 5-year period 2008 through 2012.**



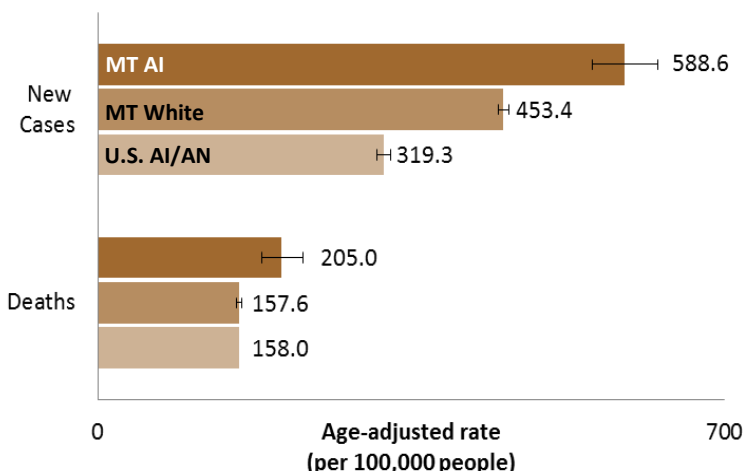
Data Source: Montana Central Tumor Registry, 2008-2012; Montana Death Records, 2008-2012

- Overall, new cancer cases (incidence) occurred at a much greater rate among MT AI (588.6 cases per 100,000 people) compared to MT Whites (453.4 cases per 100,000 people) and U.S. American Indian/Alaska Native (U.S. AI/AN) (319.3 cases per 100,000 people) (Figure 11).
- The overall cancer-related death rate (mortality) was significantly greater among MT AI compared to MT Whites and U.S. AI/AN (205.0, 157.6, and 158.0 deaths per 100,000 people, respectively) (Figure 11).
- The incidence rate of prostate cancer among MT AI was significantly lower (49% lower) than MT White (Figure 12).
- There were several cancer types that occurred at significantly greater rates among MT AI than MT Whites. These cancers were liver, kidney, uterine, lung, and colorectal (Figure 12).

### Identifying American Indian patients in the Montana Central Tumor Registry (MCTR)

American Indians are often misclassified in health record systems. To better identify MT AI patients the MCTR links with Indian Health Services administrative files of enrolled recipients of IHS services from 1990 forward each year. This record linkage allows MCTR to identify additional AI patients in the registry. These additional patients greatly improves MCTR's ability to describe the cancer burden among MT AI.

**Figure 11. Age-adjusted rate of new cancer cases (incidence) and cancer-related death (mortality) among Montana American Indians, Montana Whites, and U.S. American Indians/Alaska Natives, 2008-2012.**



Data Source: Montana Central Tumor Registry, 2008-2012; Montana Death Records, 2008-2012; [SEER 18 registries, 2007-2011](#)

**Figure 12. Comparison of Montana American Indian and Montana White Incidence Rates for the Select Cancer Sites, 2008-2012.**

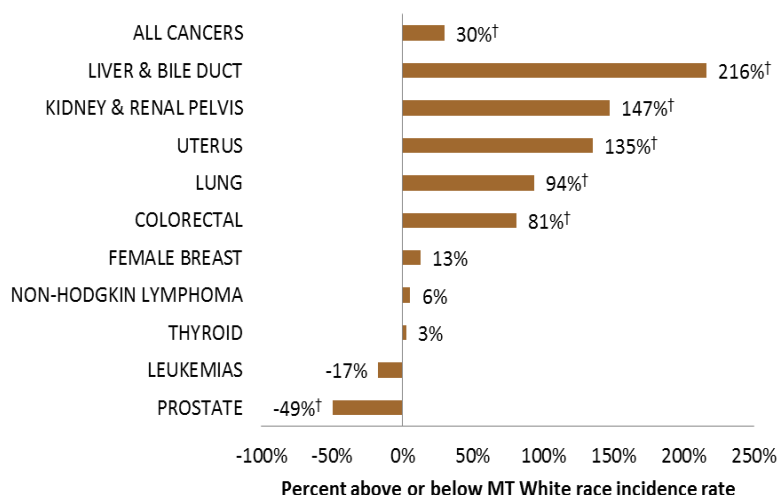


Figure 12 presents the Montana American Indian-White Incidence Rate Ratio (IRR). The IRR indicates which types of cancers among American Indians were above or below the age-adjusted incidence rate of MT White population. This information is important in understanding the unique burden cancer presents to MT AI.

† Statistically significantly different

Data Source: Montana Central Tumor Registry, 2008-2012



Female Breast Cancer in Montana  
Quick Stats

**760  
WOMEN**

ARE DIAGNOSED WITH BREAST CANCER EACH YEAR

**NUMBER  
ONE**

TYPE OF CANCER DIAGNOSED  
AMONG WOMEN

**NUMBER  
TWO**

CAUSE OF CANCER DEATH AMONG WOMEN

**63  
PERCENT**

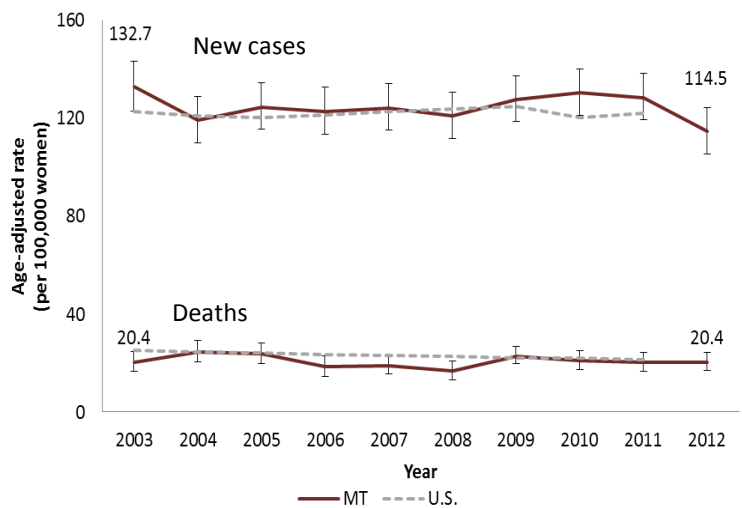
DIAGNOSED AT THE LOCAL STAGE

# Female Breast Cancer Incidence & Mortality in Montana, 2008-2012

Breast cancer is the most common cancer diagnosed among Montana women accounting for 29% of all cancers.

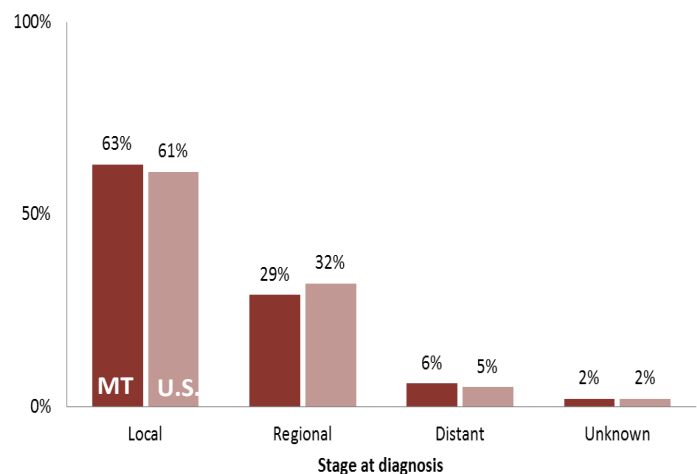
- 3,802 women in Montana were diagnosed with invasive breast cancer between 2008-2012, for an average of 760 women each year.
- 649 women died of breast cancer in Montana between 2008-2012 for an average of 130 women each year.
- In 2012, the age-adjusted incidence rate of breast cancer in Montana was 114.5 cases per 100,000 women and the mortality rate was 20.4 deaths per 100,000 women (Figure 13).
- Over the past 10-years the incidence and mortality rates of breast cancer among Montana women was similar to U.S. women (Figure 13).
- In Montana, 63% of breast cancers were diagnosed at the local stage. Stage at diagnosis in Montana was similar to the U.S. (Figure 14).
- Women were, on average, 63 years old at the time of diagnosis (data not shown).

Figure 13. Trends in age-adjusted female breast cancer incidence and mortality rates in Montana and the U.S., 2003-2012.



Data Source: Montana Central Tumor Registry, 2003-2012; Montana Death Records, 2008-2012; [United States Cancer Statistics, 2003-2011](#)

Figure 14. Stage at diagnosis of female breast cancer in Montana and the U.S., 2008-2012.



Data Source: Montana Central Tumor Registry, 2008-2012; [SEER, 2004-2010](#)

Lung Cancer in Montana  
Quick Stats

**SEVEN  
HUNDRED**

NEW CASES OF LUNG CANCER DIAGNOSED EACH YEAR

**54  
PERCENT**

OF LUNG CANCER CASES DIAGNOSED  
AT DISTANT STAGE

**NUMBER  
ONE**

CANCER RELATED DEATH

**510  
DEATHS**

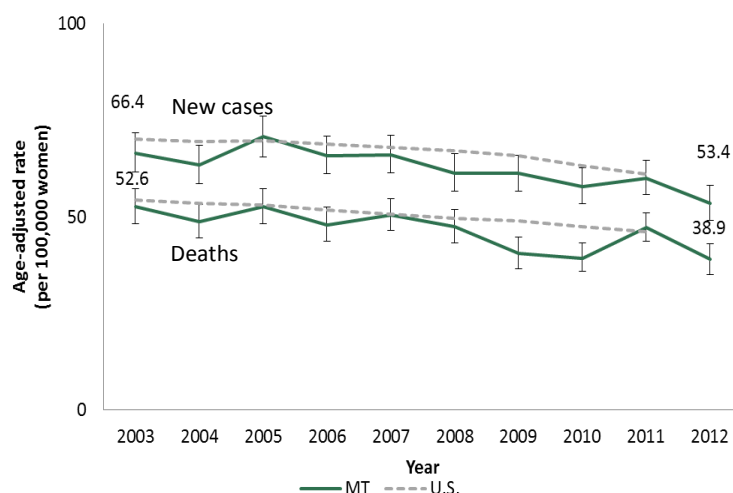
DUE TO LUNG CANCER EACH YEAR

# Lung Cancer Incidence & Mortality in Montana, 2008-2012

Lung cancer was the 2nd most common cancer diagnosed among men and women accounting for 13% of all new cancers in Montana.

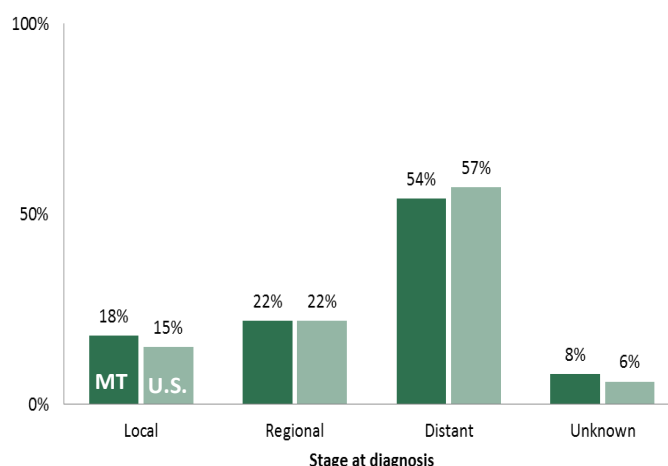
- 3,536 Montanans were diagnosed with lung cancers between 2008-2012, for an average of 700 new cases each year.
- 2,560 Montanans died of lung cancer between 2008-2012 for an average of 510 deaths each year.
- Lung cancer was the leading cause of cancer-related deaths from 2008-2012.
- In 2012 the age-adjusted incidence rate of lung cancer in Montana was 53.4 cases per 100,000 people and the mortality rate was 38.9 deaths per 100,000 people (Figure 15).
- Over the past 10-years (2003-2012) the incidence and mortality rates of lung cancer in Montana have statistically significantly decreased. Montana was similar to lung cancer incidence and mortality rates in the U.S. (Figure 15).
- In Montana, 54% of lung cancers were diagnosed at the distant stage while only 18% were diagnosed at the local stage. Stage at diagnosis in Montana was similar to the U.S. (Figure 16).
- 52% of lung cancers occurred among men in Montana and the average age at diagnosis was 71 years (data not shown).

Figure 15. Trends in age-adjusted lung cancer incidence and mortality rates in Montana and the U.S., 2003-2012.



Data Source: Montana Central Tumor Registry, 2003-2012; Montana Death Records, 2003-2012; [United States Cancer Statistics, 2003-2011](#)

Figure 16. Stage at diagnosis of lung cancer in Montana and the U.S., 2008-2012.



Data Source: Montana Central Tumor Registry, 2008-2012; [SEER, 2004-2010](#)

Prostate Cancer in Montana  
Quick Stats

**830**  
**NEW CASES**

OF PROSTATE CANCER WERE DIAGNOSED EACH YEAR

**SECOND**  
**LEADING**

CAUSE OF CANCER RELATED DEATH  
AMONG MEN

**120**  
**DEATHS**

DUE TO PROSTATE CANCER EACH YEAR

**81**  
**PERCENT**

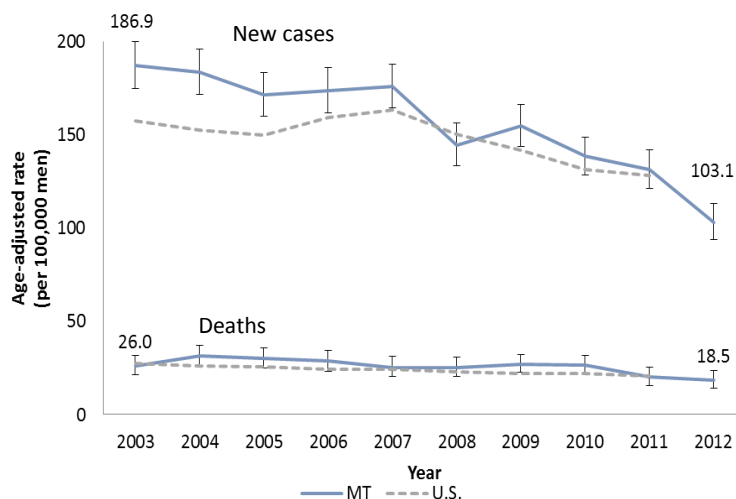
DIAGNOSED AT LOCAL STAGE

# Prostate Cancer Incidence & Mortality in Montana, 2008-2012

Prostate cancer was the most common cancer diagnosed among men, accounting for 28% of new cancers among Montana men.

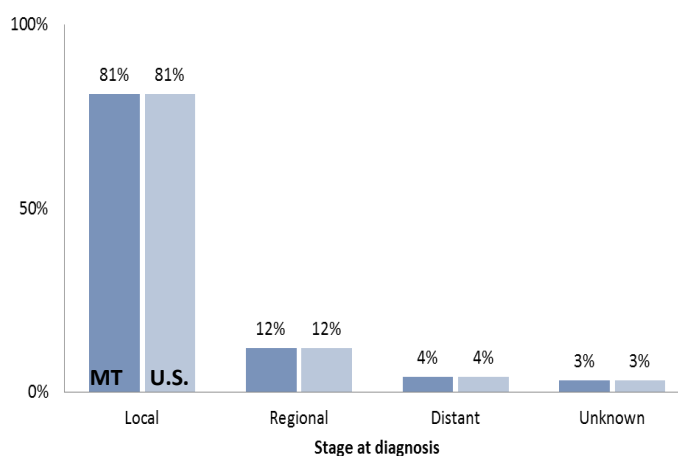
- 4,153 Montanans were diagnosed with prostate cancer between 2008-2012, for an average 830 new cases each year.
- 590 men died of prostate cancer between 2008-2012 for an average of 120 deaths each year in Montana.
- Prostate cancer was the 2nd leading cause of cancer-related deaths among Montana men from 2008-2012.
- In 2012, the age-adjusted incidence rate of prostate cancer in Montana was 103.1 cases per 100,000 men and the mortality rate was 18.5 deaths per 100,000 men (Figure 17).
- Over the past 10-years (2003-2012) the incidence rate of prostate cancer in Montana has statistically significantly decreased (Figure 17).
- The incidence and mortality rates in Montana were similar to prostate cancer incidence and mortality rates in the U.S. (Figure 17).
- 81% of prostate cancers were diagnosed at the local stage. Stage at diagnosis in Montana was similar to the U.S. (Figure 18).
- In Montana the average age at diagnosis was 67 years (data not shown).

Figure 17. Trends in age-adjusted prostate cancer incidence and mortality rates in Montana and the U.S., 2003-2012.



Data Source: Montana Central Tumor Registry, 2003-2012; Montana Death Records, 2003-2012; [United States Cancer Statistics, 2003-2011](#)

Figure 18. Stage at diagnosis of prostate cancer in Montana and the U.S., 2008-2012.



Data Source: Montana Central Tumor Registry, 2008-2012; [SEER, 2004-2010](#)

Cervical Cancer in Montana  
Quick Stats

**35**  
**NEW CASES**

OF CERVICAL CANCER DIAGNOSED EACH YEAR

**ONE**  
**PERCENT**

OF CANCERS DIAGNOSED AMONG  
WOMEN ARE CERVICAL CANCER

**LESS THAN**  
**10**

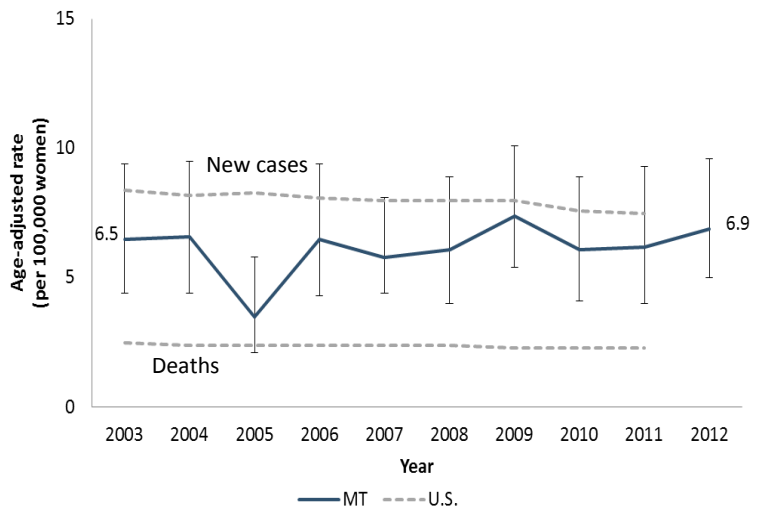
CERVICAL CANCER DEATHS EACH YEAR

# Cervical Cancer Incidence & Mortality in Montana, 2008-2012

Until the mid-1900s cervical cancer was a leading cause of cancer death for women in Montana and the U.S.<sup>2</sup> Presently, cervical cancer accounts for less than 1% of cancer-related deaths among Montana women. This decline in cervical cancer mortality is largely due to widespread screening via the Pap smear.

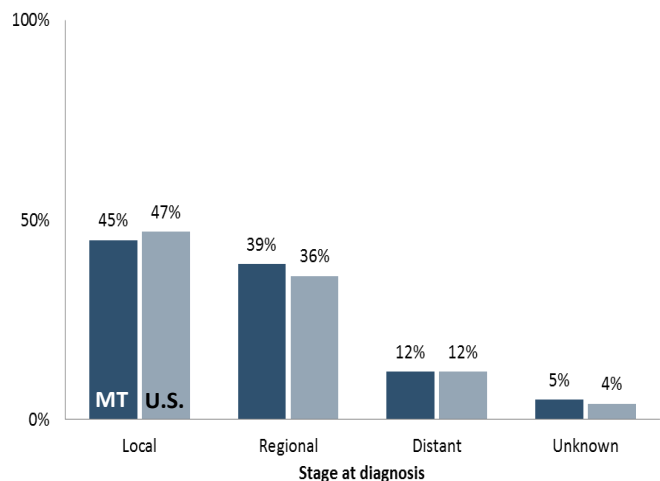
- 173 Montanans were diagnosed with invasive cervical cancer between 2008-2012, for an average 35 new cases each year.
- 1,324 in-situ (pre-cancerous lesions) cases were reported from 2008-2012.
- 44 women died of cervical cancer between 2008-2012 for an average of 9 deaths each year in Montana.
- Cervical cancer ranked 13th and 17th in terms of cancer incidence and mortality, respectively, in Montana from 2008-2012.
- In 2012, the age-adjusted incidence rate of cervical cancer in Montana was 6.9 cases per 100,000 women (Figure 19).
- The incidence rate was similar to the cervical cancer incidence rate in the U.S. (Figure 19).
- There were too few deaths in Montana to calculate a stable cervical cancer mortality rate for each year from 2003-2012 (Figure 19). However, from 2008-2012 the mortality rate was 1.5 deaths per 100,000 women.
- In Montana and the U.S., 45% of cervical cancers were diagnosed at the local stage when treatment is most effective (Figure 20).
- In Montana, the average age at diagnosis was 52 years (data not shown).

Figure 19. Trends in age-adjusted cervical cancer incidence and mortality rates in Montana and the U.S., 2003-2012.



Data Source: Montana Central Tumor Registry, 2003-2012; Montana Death Records, 2003-2012; [United States Cancer Statistics, 2003-2011](#)

Figure 20. Stage at diagnosis of cervical cancer in Montana and the U.S., 2008-2012.



Data Source: Montana Central Tumor Registry, 2008-2012; [SEER, 2004-2010](#)

<sup>2</sup> Centers for Disease Control and Prevention, Cervical Cancer Statistics. Last updated September 2, 2014. Accessed at: <http://www.cdc.gov/cancer/cervical/statistics/>



Montana  
**Cancer Control Programs**  
Chronic Disease Prevention & Health Promotion Bureau



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